original context identifier length is exceeded. According to a further preferred embodiment of the invention, in response to exceeding the number of data packet connections allowed by the maximum value of the context identifier length, the convergence protocol layer is directed to define for the data packet connections several link-level connections, to which the data packet connections are allocated.

[0010] The method and system of the invention provide the advantage that at least as many data connections being transmitted on the radio bearer as allowed by the length of the context identifier field at its maximum can in all situations be compressed. Further, the procedure of the invention provides the advantage that discontinuation of compression for the data connections that are transmitted compressed is avoided. A yet further advantage of the invention is that it enables applying header field compression to data connections in the most efficient manner possible, which is advantageous for the efficient utilisation of radio resources.

BRIEF DESCRIPTION OF THE FIGURES

[0011] In the following, the invention will be described in greater detail by means of preferred embodiments and with reference to the appended drawings in which

[0012] Figure 1 is a block diagram of transitions between different compression levels of ROHC,

[0013] Figure 2 is a block diagram of transitions between different operational modes of ROHC,

[0014] Figure 3 is a block diagram of a simplified structure of the UMTS system,

[0015] Figures 4a and 4b show protocol stacks of the UMTS packet data service for control signalling and transmitting user data,

[0016] Figures 5a and 5b show operational models of the PDCP layer, and

[0017] Figure 6 shows defining data packet identifiers according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0018] In the following, the implementation of the header field compression method ROHC in question is described for the parts essential for the invention. For a more detailed description of the compression method in

question, reference is made to a yet unfinished Internet draft "Robust Header Compression (ROHC)", version 04, 11 October 2000.

[0019] In different compression methods, a context is typically defined for both a compressor and a decompressor, the context being a state which the compressor uses to compress a header field to be transmitted and the decompressor uses to decompress a received header field. Typically, the context comprises an uncompressed version of the previous header field transmitted (compressor) or received (decompressor) over a data transfer connection. In addition, the context can comprise information identifying a data packet flow, such as sequence numbers or time stamps of data packets. Thus, the context typically comprises both static information, which remains the same for the entire data packet flow, and dynamic information, which changes during the data packet flow, but often does it according to a defined pattern.

[0020] ROHC uses three compression levels in such a manner that the compression is started on the lowest level and continues gradually to the higher levels. The basic principle is that compression is always performed on the highest possible level, in such a manner, however, that the compressor has sufficient certainty of the fact that the decompressor has enough information to perform decompression on the level in question. Factors affecting the move between different compression levels are variation in consecutive header fields, positive and negative acknowledgements received from the decompressor, and when there are no acknowledgements, the expiration of specific sequential counters. It is possible to move correspondingly to a lower level from a higher compression level.

[0021] The compression levels ROHC uses in connection with IP (Internet Protocol), UDP (User Datagram Protocol) and RTP (Real-Time Protocol) protocols are initiation/refresh (IR), first order (FO), and second order (SO), and transitions between these levels are described in the diagram of Figure 1. The IR level is used to create the context for the decompressor or to recover from an error situation. The compressor moves to the IR level when header field compression is started, requested by the decompressor, or when an update timer expires. On the IR level, the compressor sends IR header fields in an uncompressed format. The compressor tries to move to a higher level when it is certain that the decompressor has received the update information.

[0022] The FO level is used to inform the recipient of irregularities in the header fields of the data packet flow. After the IR level, the compressor operates on the FO level in a situation where the header fields do not form a uniform pattern (in other words, consecutive header fields change randomly in such a manner that the changes cannot be predicted) or the compressor cannot be certain that the decompressor has received the parameters defining the uniform pattern of the header fields. This is a typical situation when transmitting speech, for instance, is started, especially during the first speech bursts. On the FO level, the compressor sends compressed FO header fields. The compressor again tries to move to a higher level if the header fields form a uniform pattern and it is certain that the decompressor has received the parameters defining the uniform pattern. The FO-level data packets comprise typically context update information, which means that a successful decompression also requires a successful transmission of consecutive FO header fields. Thus, the success of the decompression process is sensitive to lost or damaged FO-level packets.

[0023] On the SO level, compression is optimal. The header fields form a uniform pattern which the compressor depicts with compressed SO header fields which, in practice, are sequence numbers of the data packets. Information is transmitted already on the FO level to the decompressor on parameters defining the uniform pattern of the header fields, and on the basis of the parameters and the received sequence number, the decompressor can extrapolate the original header fields. Because the data packets sent on the SO level are, in practice, independent of each other, the error sensitivity of decompression is also low. When the header fields no longer form a uniform pattern, the compressor moves back to the FO level.

[0024] Decompression also has three levels which are bound to the context definition of the decompressor. The decompressor always starts its operation from the lowest level when no context has yet been defined (No Context). The decompressor has then not yet decompressed any data packets. When the decompressor has decompressed the first data packet which comprises both static and dynamic context information, it can move over the middle level (Static Context) straight to the top level (Full Context). As a result of several error situations on the top level, the decompressor moves to the middle level, but typically even one successfully decompressed data packet returns the decompressor to the top level.